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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/927,089	08/09/2001	Sinichi Ishibashi		4097

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EXAMINER	
CULBERT, ROBERTS P	

ART UNIT	PAPER NUMBER
1763	

DATE MAILED: 04/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/927,089	ISHIBASHI ET AL.	
	Examiner	Art Unit	
	Roberts Culbert	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 January 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *14-16,18 and 21-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *14-16, 18 and 21-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 1/23/06 have been fully considered but they are not persuasive.

Applicant has argued Chu fails to teach the newly added limitation specifying that particles on the *entire* surface are removed. The argument is not persuasive because Chu teaches that the entire surface is etched since the surface is overetched in order to transfer the mask pattern into the surface. See (Col. 5, lines 38-46) and (Col. 7, Lines 5-16).

Applicant has argued that a person of ordinary skill would not be motivated to necessarily employ the plasma etching technique, since Yokoyama teaches that such techniques are not necessary to improve error rates. However, one of ordinary skill in the art would have been motivated at the time of invention to perform the plasma etching in order to provide improved adhesion to the lubricant layer as taught by Yokoyama.

Applicant has argued that there is no basis in the cited art for the proposition that minimization of surface defects and improvement of surface quality -- and hence, reduction of error rates -- would naturally flow from plasma etching as instantly claimed. The only basis for such an assertion is derived from the present disclosure. In fact, Chu et al. teaches that the plasma etching method "*can, therefore, greatly reduce the defects and provide well controlled topography as compared with conventional mechanical texturing methods*" (Col. 7, Lines 55-58)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,635,037 to Chu in view of JP-08-315356 A to Honda et al.

Referring to figure 3, Chu teaches a method for forming a thin-film magnetic recording medium comprising the steps of forming a laminate (14 and 15) for magnetic data recording on a nonmagnetic substrate (12 and 13); the step of forming being a dry processes in a vacuum atmosphere; forming a protective layer (20) on the laminate; the step of forming a protective layer being a dry process in a vacuum atmosphere, plasma-etching a first surface of the protective layer (Col. 7, Lines 1-8); the step of plasma-etching conducted in a vacuum; conducting the steps of forming a laminate, forming a protective layer, and plasma-etching continuously (Col. 7, Lines 26-33); and forming a lubricant layer (17) on the first surface of said protective layer.

Regarding the limitation of removing particles from the *entire* surface of the protective layer to form a smooth surface, the limitation is present in the plasma etching process of Chu. (Col. 7, Lines 37-54) the etching process of Chu removes both masking and protective layer particles from the entire substrate to form a smooth surface. Note that the etching process requires overetching the masking layer and therefore the entire surface is etched. See (Col. 5, lines 38-46) and (Col. 7, Lines 5-16).

Although Chu teaches that by proper choice of the types of gases and the proportions thereof etching rate may be controlled (Col. 7, lines 2-8) and suggests a mixture of oxygen and argon (an inert

gas) as an example, Chu does not expressly teach the use of a process gas mixture comprising an inert gas, an oxygen gas, a nitrogen gas and a gas selected from the group consisting of a chlorine gas and a fluorine gas. However, Honda et al. teaches a method of forming a thin-film magnetic recording medium including forming a magnetic layer on a non-magnetic substrate, forming a protective layer on the magnetic layer and plasma etching the magnetic layer using a process gas mixture comprising an inert gas, an oxygen gas, a nitrogen gas and a gas selected from the group consisting of a chlorine gas and a fluorine gas. (See paragraphs 10 and 25 of full translation)

It would have been obvious to one of ordinary skill in the art at the time of invention to use a process gas including argon, oxygen, and nitrogen and a gas selected from the group consisting of a chlorine gas and a fluorine gas as shown by Honda et al. to etch the protective carbon layer of Chu et al.

One of ordinary skill in the art would have been motivated at the time of invention to use the process gas mixture suggested by Honda to etch the protective layer of Chu because Honda teaches that similar effectiveness is achieved for etching a carbon protective layer using the various gasses mixed with oxygen.

Regarding claims 22 and 23, Chu teaches reactive ion etching or sputtering in the same vacuum apparatus to deposit the laminate and the protective layer (Col. 7, lines 26-33).

Regarding claim 24, as applied above, Chu in view of Honda et al. teaches the method of the invention substantially as claimed, but does not teach the ratio of the etch gasses such as a mixture of Ar O_2, and N_2 with a ratio of 6:1:3. However, it would have been obvious at the time of invention to optimize the ratio of known etch gasses in order to control the etch rate and material selectivity as taught by Chu (Col. 7, lines 2-8).

Further, claim 24 differs from Chu in view of Honda only by specifying various concentrations of the etch gasses. A person having ordinary skill in the art at the time of the claimed invention would have found it obvious to modify the ratio of reactant species by using different processing parameters because

same were known to be cause effective variables in the plasma etching art and routine experimentation would have been expected to optimize them. See *In re Boesch*, 205 USPQ 215 (CCPA 1980).

In general, changes in temperature, concentrations, or other process conditions of an old process, do not impart patentability unless the recited changes are critical, i.e., they produce a new and unexpected result. See MPEP 2144.05.

Claims 14-16, 18 and 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,635,037 to Chu in view of JP-08-315356 A to Honda et al. and in further view of U.S. Patent 4,816,334 to Yokoyama et al.

Referring to figure 3, Chu teaches a method for forming a thin-film magnetic recording medium comprising the steps of forming a laminate (14 and 15) for magnetic data recording on a nonmagnetic substrate (12 and 13); the step of forming being a dry processes in a vacuum atmosphere; forming a protective layer (20) on the laminate; the step of forming a protective layer being a dry process in a vacuum atmosphere, plasma-etching a first surface of the protective layer (Col. 7, Lines 1-8); the step of plasma-etching conducted in a vacuum; conducting the steps of forming a laminate, forming a protective layer, and plasma-etching continuously (Col. 7, Lines 26-33); and forming a lubricant layer (17) on the first surface of said protective layer.

Regarding the limitation of removing particles from the *entire* surface of the protective layer to form a smooth surface, the limitation is present in the plasma etching process of Chu. (Col. 7, Lines 37-54) the etching process of Chu removes both masking and protective layer particles from the entire substrate to form a smooth surface. Note that the etching process requires overetching the masking layer and therefore the entire surface is etched. See (Col. 5, lines 38-46) and (Col. 7, Lines 5-16).

Although Chu teaches that by proper choice of the types of gases and the proportions thereof etching rate may be controlled (Col. 7, lines 2-8) and suggests a mixture of oxygen and argon (an inert gas) as an example, Chu does not teach the use of a process gas mixture comprising an inert gas, an oxygen gas, a nitrogen gas and a gas selected from the group consisting of a chlorine gas and a fluorine gas.

Referring to the full translation provided, Honda et al. teaches a method of forming a thin-film magnetic recording medium including forming a magnetic layer on a non-magnetic substrate, forming a protective layer on the magnetic layer and plasma etching the magnetic layer using a process gas mixture comprising an inert gas, an oxygen gas, a nitrogen gas and a gas selected from the group consisting of a chlorine gas and a fluorine gas. (Paragraphs 10 and 25)

It would have been obvious to one of ordinary skill in the art at the time of invention to use a process gas including argon, oxygen, and nitrogen and a gas selected from the group consisting of a chlorine gas and a fluorine gas as shown by Honda et al. to etch the protective carbon layer of Chu et al.

One of ordinary skill in the art would have been motivated at the time of invention to use the process gas mixture suggested by Honda to etch the protective layer of Chu because Honda teaches that similar effectiveness is achieved for etching a carbon protective layer using the various gasses mixed with oxygen.

Chu in view of Honda et al. does not expressly teach that the step of plasma etching is carried out immediately after forming the protective layer. However, earlier prior art methods do not use the additional intermediate masking step and would have been obvious to one of ordinary skill in the art. For example, Yokoyama et al. teaches a method of forming a thin-film magnetic recording medium comprising forming a laminate (4, 5 and 6) for magnetic data recording on a nonmagnetic substrate (2 and 3), forming a protective layer (7) on the laminate, and forming a lubricant layer (8) on the protective layer. Yokoyama et al. further teaches that the protective layer is plasma etched after forming the protective layer without intermediate masking steps (i.e. immediately after) in order to improve the adhesion of the lubricant layer to the protective layer. (Col. 8, Lines 11-33)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to perform the plasma-etching step of Chu in view of Honda et al. immediately after the step of forming the protective layer.

One of ordinary skill in the art would have been motivated at the time of invention to perform the steps successively in order to provide improved adhesion to the lubricant layer as taught by Yokoyama et al.

Regarding claims 14, 15, 22 and 23, Chu teaches reactive ion etching or sputtering in the same vacuum apparatus to deposit the laminate and the protective layer (Col. 7, lines 26-33).

Regarding claims 18 and 24, as applied above, Chu in view of Honda et al. teaches the method of the invention substantially as claimed, but does not teach the ratio of the etch gasses such as a mixture of Ar O_2, and N_2 with a ratio of 6:1:3. However, it would have been obvious at the time of invention to optimize the ratio of known etch gasses in order to control the etch rate and material selectivity as taught by Chu (Col. 7, lines 2-8).

Further, claims 18 and 24 differ from Chu in view of Honda only by specifying various concentrations of the etch gasses. A person having ordinary skill in the art at the time of the claimed invention would have found it obvious to modify the ratio of reactant species by using different processing parameters because same were known to be cause effective variables in the plasma etching art and routine experimentation would have been expected to optimize them. See *In re Boesch*, 205 USPQ 215 (CCPA 1980).

Changes in temperature, concentrations, or other process conditions of an old process, do not impart patentability unless the recited changes are critical, i.e., they produce a new and unexpected result. See MPEP 2144.05.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action

is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberts Culbert whose telephone number is (571) 272-1433. The examiner can normally be reached on Monday-Friday (8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

R. Culbert
Examiner
Art Unit 1763

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